Raytheon's Six Sigma Process and Its Application for CMMI

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Outline

- Raytheon Six Sigma (R6σ)
- The Basic R6σ Process and Tools
- R6σ Applied to CMMI Process Improvement
- Optimizing Processes- Level 5

Raytheon Six Sigma (R6σ)

Raytheon
Space and Airborne Syste

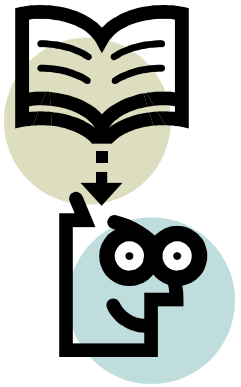
R6σ is a

Knowledge Based Process

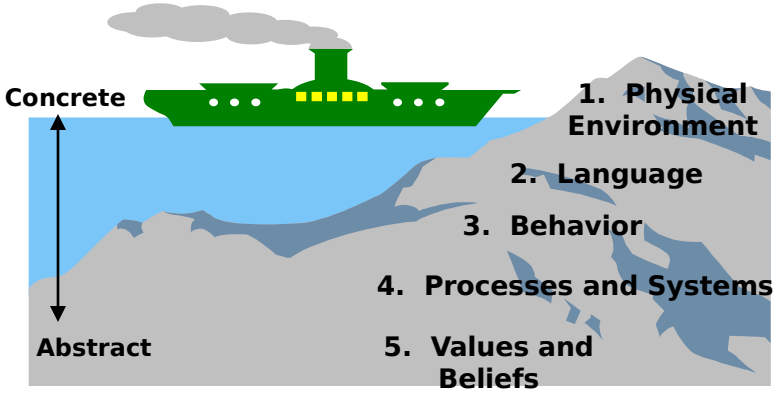
we will use to

Transform Our Culture

in order to



Maximize Customer Value



and

Grow Our Business

Raytheon Six Sigma (R6σ)

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- Tenets
  - Specify value in the eyes of the customer
  - Identify value stream
  - Simplify the steps and eliminate waste & variation along the value stream
  - Make value flow at the pull of the customer
  - Involve and empower employees
  - Continuously improve knowledge in pursuit of perfection
- Approach
  - Simple standard process
  - Tools to focus on measurements
  - Measures become knowledge

Tenets of Raytheon Six Sigma are the same as "L

The Basic R6σ Process

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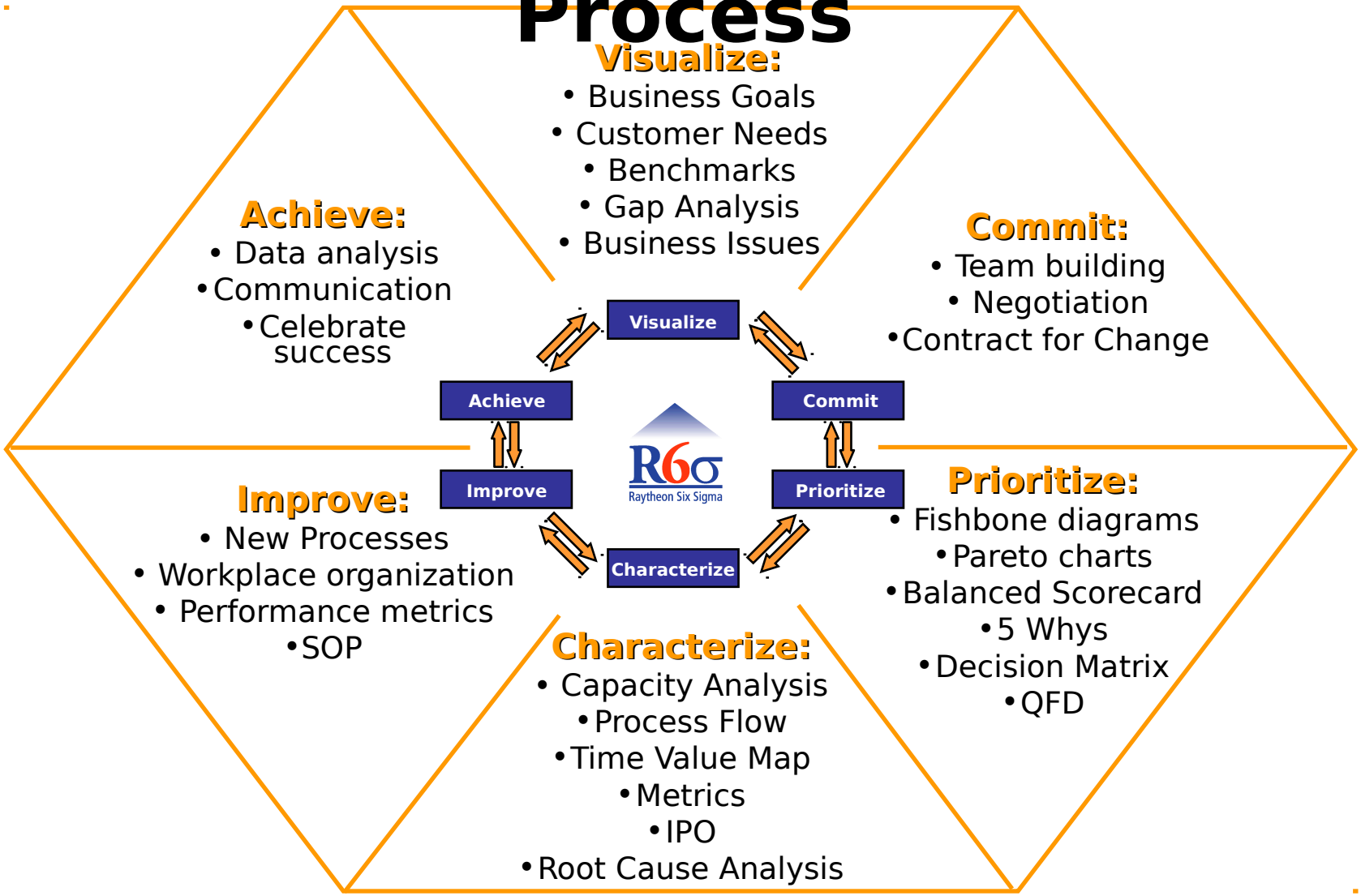

The Basic R6σ Process

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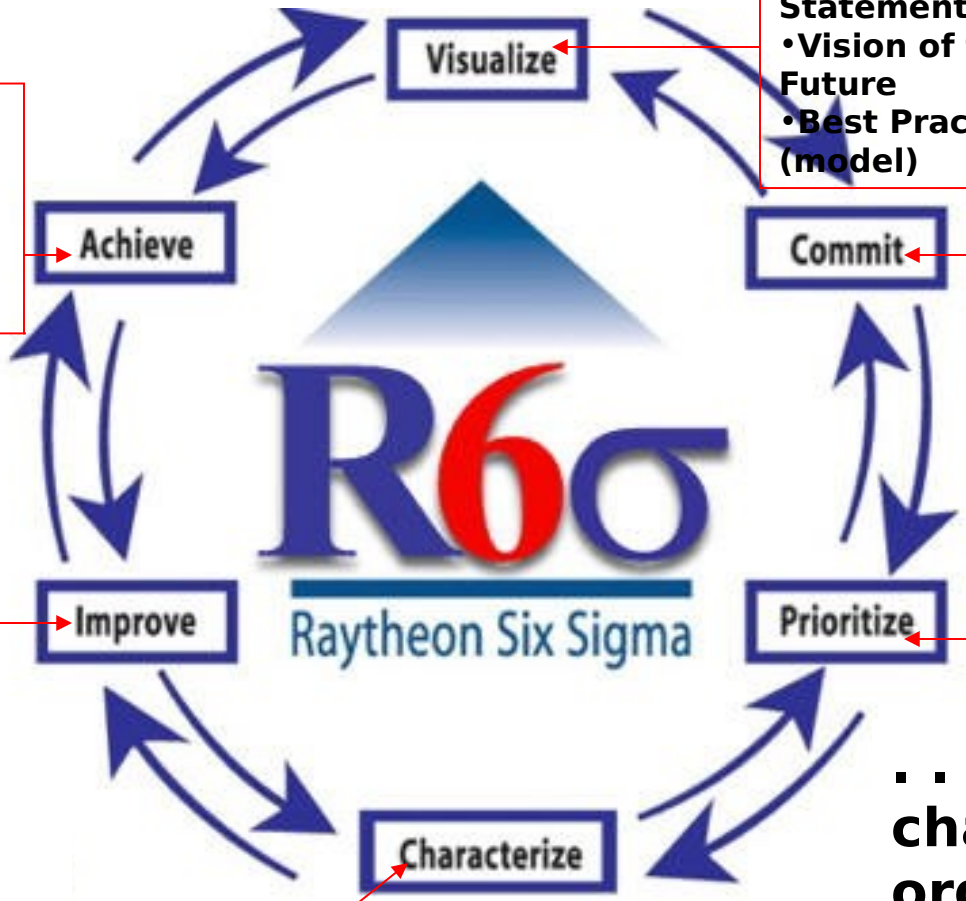

- Problem Statement
- Vision of the Future
- Best Practice (model)

- All Stakeholders
- Sponsorship
- Resources

- Develop Criteria
- Decision Analysis
- Gap Assessment

- Identify value stream
- Root cause analysis
- Assessment

- Monitor metrics
- Train personnel
- Deploy
- Institutionali z

- Improve metrics
- Share lessons, best practices
- Share Knowledge
- Celebrate

Provides the framework for activities . . .

. . . to make changes in an organizational process.

The Basic R6σ Process

Raytheon
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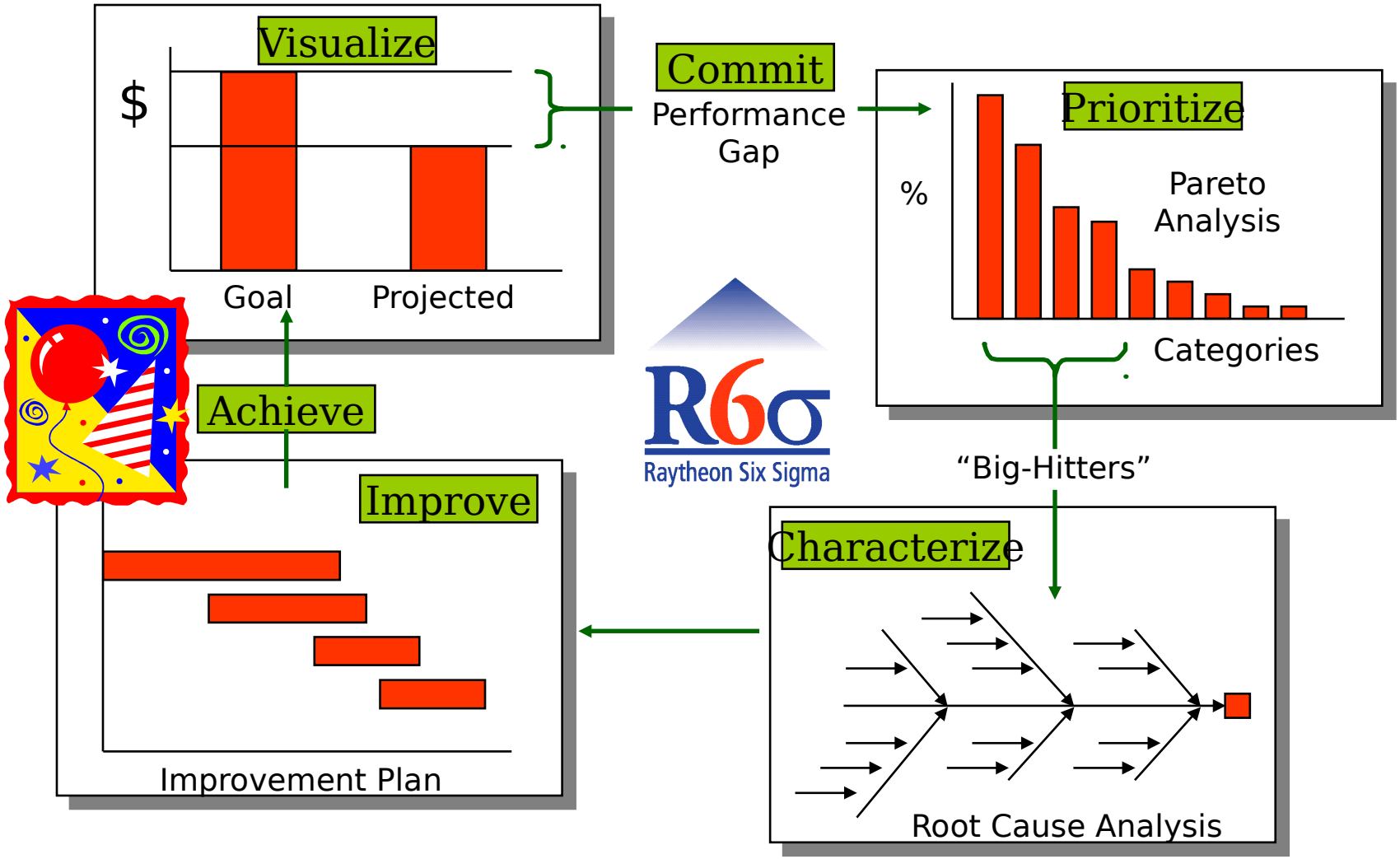

R6σ Applied to CMMI Process Improvement

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- For Product Development Process
  - Knowledge Based Process (facts and measured process data)
  - Transform Culture (mature processes quickly in steps that provide sustained change)
  - Maximize Customer Value (discipline without bureaucratic waste)
- This institutionalized process is used to support rapid maturation and model compliance
- By application of the tenets, methods, process and tools in organizational business processes

R6σ Applied to CMMI Process Improvement

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- Improved deployment metrics
- Share lessons, best practices
- Share Knowledge throughout Raytheon
- Celebrate Ratings

- CMMI level 3 to remain competitive
- Stable performance- reduce process variation
- Program Managers (WIIFM)- Cost and Schedule Performance Improvement

- VP Level Oversight Team Appointed
- Leadership Briefings and Meetings
- Resources Allocated-Budget/Staff
- Steering Committee Established
- Program Leadership Council Established

- Deploy the process
- Measure the process
- Collect Artifacts
- Train the practitioners

- SOW for the Enterprise Process Group (EPG)
- Process Improvement Plan
- IPI Appraisals (4) (Class B)
- Gate 5 (PLAN) Review
- Gap Assessment to model
- Cost/Benefit Analysis

- Examine existing processes to leverage - document (eg. IPDS, Team of X, SW CMM)
- Revise existing processes to address gaps from CMMI model
- Find best practices to steal from other Raytheon organizations
- Scorecards for monitoring progress
- Risk Analysis and mitigation

Process Improvement

Many CMMI process areas have elements of R6σ

- Measurement and Analysis (MA)
- Decision Analysis and Resolution (DAR)
- Causal Analysis and Resolution (CAR)
- Organization Innovation and Deployment
- Collect Improvement Information (GP 3.2)

R6σ Applied to CMMI Process Improvement

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- Measurement and Analysis
  - **Develop and sustain a measurement capability that is used to support management information needs**

- Raytheon Six Sigma
  - **Develop (Characterize, Improve) and sustain a measurement capability (Achieve) that is used to support management information needs (Visualize, Commit)**
  - **Achievement requires a sustained metric**

- Decision Analysis and Resolution
  - **Analyze possible decisions using a formal evaluation process that evaluates identified alternatives against established criteria**
- Raytheon Six Sigma
  - **Analyze possible decisions using a formal evaluation process (Prioritize) that evaluates identified alternatives against established criteria**
  - **Every employee is trained in six sigma methods and tools for prioritizing: making decisions about what has priority**
  - **Decision Tools include QFD, OPM, Balanced Scorecard, Ishikawa, Decision Tree, Pareto, FMECA**

Process Improvement

- Causal Analysis and Resolution
  - **Identify causes of defects and other problems and take action to prevent them from occurring in the future**

- Raytheon Six Sigma
  - **Identify causes of defects (Characterize) and other problems and take action to prevent them from occurring in the future (Improve)**
  - **Every employee is trained in six sigma methods and tools to determine root cause**
  - **Characterization Tools include Gemba, Value Stream Mapping, FMECA, Root Cause Analysis (5 Whys)**

R6σ Applied to CMMI Process Improvement

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- Organization Innovation and Deployment
  - **Select and deploy incremental and innovative improvements that measurably improve the organization's processes and technologies, aligned to organization's business objectives**

- Raytheon Six Sigma
  - **Select (Visualize, Commit, Prioritize) and deploy incremental and innovative improvements (Characterize, Improve, Achieve) that measurably (Achieve) improve, aligned to organization's business objectives (Visualize, Commit)**

Process Improvement

- Collect Improvement Information
  - **Collect work products, measures, measurement results, and improvement information derived from … process to support future use and improvement of the organization's processes and process assets.**
- Raytheon Six Sigma
  - **Collect work products, measures, measurement results, and improvement information (Achieve)**
  - **All six sigma work is stored in a Power Steering Database- providing leadership with aggregated financial improvement data**
  - **Knowledge sharing is a core tenet of six sigma: to share best practices and lessons learned**

Optimizing Processes

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- At the peak of maturity and institutionalization, CMMI level 5 and Raytheon Six Sigma are very much aligned
- Process Capability (C_pk) applied to engineering processes
  - measured and controlled processes with process control limits
  - measured over a statistically significant sample
  - engineering development process can be modeled statistically
  - measured and calibrated over time

Raytheon Six Sigma is An Institutionalized Process to Achieve Level 5

Summary

- **R6σ** is a knowledge based process transforming Raytheon culture to maximize customer value and grow our business.
- **R6σ** tenets are the same as "Lean"
- Basic **R6σ** process (visualize → commit → prioritize → characterize → improve → achieve) provides a framework for organizational process change.
- **R6σ** genesis was to:
  - Gain production benefits
  - Leverage improvements across the enterprise
  - Focus on the company's value stream
- CMMI process areas share **R6σ** elements: MA, DAR, CAR, OID, GP 3.2
- **R6σ** is an institutionalized process to achieve CMMI Level 5
- **R6σ** accelerates Raytheon's process maturation, and it provides a framework to help drive CMMI efforts across all business areas and disciplines